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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,917	08/26/2003	Blaine D. Gaither	10015698-4	5774

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HEWLETT-PACKARD COMPANY  
Intellectual Property Administration  
P.O. Box 272400  
Fort Collins, CO 80527-2400

EXAMINER
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BRADLEY, MATTHEW A

ART UNIT	PAPER NUMBER
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2187

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/649,917

Applicant(s)

GAITHER, BLAINE D.

Examiner

Matthew Bradley

Art Unit

2187

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 7-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9 and 10 is/are allowed.
- 6) ☒ Claim(s) 1-4, 7 and 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Amendment*

This Office Action has been issued in response to amendment filed 14 November 2005. Applicant's arguments have been carefully and fully considered in light of the instant amendment, but are considered moot in light of the new ground(s) of rejection not necessitated by amendment. Accordingly, this action has **NOT** been made final.

The Examiner would like to draw applicant's attention to the change of Examiner for this case.

### *Claim Status*

Claims 5-6 are cancelled. Claims 1-4 and 7-10 remain pending and are ready for examination.

### *Double Patenting*

The double patenting rejections made in the Office Action dated 16 August 2005 have been withdrawn in light of the terminal disclaimer received and dated 14 November 2005.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner notes that the ordinary definition of a bus is, "a set of hardware lines used for **data transfer** among the components of a computer

system.” As instantly claimed, the applicant’s intend a bus to *own* an individual line within a group of lines. As commonly used throughout industry and shown by the ordinary definition, a bus is simply a resource used to transfer data. Referring back to the applicant’s specification, no ordinary or special bus is described which can possess *ownership* of an individual line. For purposes of examination, the Examiner is interpreting the applicant’s to have meant the bus connected to the device, thus the device as a whole maintains ownership.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, and 7-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Duncan et al (U.S. 6,832,282) herein after referred to as Duncan. The instant claims are being rejected in light of the 35 U.S.C. 112 rejection as noted supra.

As per independent claim 1, Duncan teach,

- a cache memory that reads and caches a group of lines with a single memory transaction; and (Column 13 lines 59-67)

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- a system for maintaining identity of which device, if any, owns the group of lines, and which device, if any, owns each individual line within the group of lines (Column 7 lines 24-30).
- *The Examiner notes that the EV7s as taught in Duncan “hold copies” of a cache line. This holding of a cache line anticipates the instant limitation by showing which device owns the line. As the system of Duncan can hold and maintain indication of which EV7s hold each line, a group of lines (as shown in column 13 lines 59-67) belongs to a certain device upon pre-fetch thus anticipating the instant limitation of a device owning a group of lines.*

As per dependent claim 2, Duncan teach, the system for maintaining identity of which bus, if any, owns each individual line within the group of lines (Column 7 lines 24-30).

As per dependent claim 3, Duncan teach, at least two lines in the group of lines having separate owners (Column 7 lines 24-30). *The Examiner notes that “each” cache line of Duncan is associated with a specific EV7. As known in the art, multiple cache lines are present in a system and as shown in Figure 1, multiple EV7s can take claim to a specific set of lines. Additionally, as taught in column 8 lines 35-38, the EV7s are allowed to obtain copies of data that are in a “shared” state. Accordingly, multiple cache lines in a specific group have separate owners via the “shared” state.*

As per independent claim 4, Duncan teach,

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- a cache memory that reads a group of lines with a single memory transaction; and (Column 13 lines 59-67)
- the cache memory receiving fewer than all lines within the group of lines, when the group of lines is requested, and when the group of lines is partially owned by another cache memory (Column 14 lines 9-12). *The Examiner notes that the EV7 is able to obtain lines that are shared as noted supra. The Examiner is interpreting the shared lines to be partially owned as not one EV7 has to maintain exclusive ownership of the lines. This being the case, the act of the EV7 prefetching, anticipates the instant limitation since the EV7 is able to access a group of lines that might be shared, 'owned', by another EV7.*

As per independent claim 7, Duncan teach,

- retrieving a group of lines in response to a request for a single line; and (Column 13 lines 59-67)
- maintaining ownership information for the group of lines and for each individual line within the group of lines (Column 7 lines 24-30).
- *The Examiner notes that the EV7s as taught in Duncan "hold copies" of a cache line. This holding of a cache line anticipates the instant limitation by showing which device owns the line. As the system of Duncan can hold and maintain indication of which EV7s hold each line, a group of lines (as shown in column 13 lines 59-67) belongs to a certain device upon pre-*

*fetch thus anticipating the instant limitation of a device owning a group of lines.*

As per independent claim 8, Duncan teach,

- o requesting, by a processor a line of memory; copying, from a shared memory, to a cache memory, the line of memory requested; (Column 13 lines 59-67)
- o copying, from the shared memory to the cache memory, all additional unowned lines within a group of lines corresponding to the requested line, and not copying any owned lines, other than the requested line, within the group of lines (Column 8 lines 31-35 and Column 14 lines 9-13).
- o *The Examiner notes that the IO7 cannot maintain a copy of data that is shared. As discussed supra, a copy of data that is shared is not exclusively owned. Therefore when the IO7 prefetches data, it copies additional data that the I/O device might request in the future. The additional data that is copied must be data that is not shared, or 'data that is owned.' Accordingly, the IO7 copies additional lines that are not shared, unowned, and only copies the requested unshared, owned, lines.*

***Allowable Subject Matter***

Claims 4 and 8-10 were indicated allowable in the Office Action dated 16 August 2005.

Claims 4 and 8 are now rejected as noted supra.

Claims 9 and 10 remain allowable for at least the reasons indicated in the previous Office Action noted supra.

### ***Response to Arguments***

Applicant's arguments have been carefully and fully considered in light of the instant amendment, filed 14 November 2005, but are considered moot in light of the new ground(s) of rejection as necessitated by amendment and noted supra.

With respect to applicant's arguments located in the third paragraph on page 4 of the instant remarks which recites:

*'Duncan et al do not teach or suggest maintaining ownership information for a group of lines in addition to maintaining ownership information for each individual line.'*

The Examiner respectfully disagrees. As taught in Duncan et al col. 7 lines 24-30, each memory data block or cache line, is associated with a directory and maintains an indication of which EV7 in the system holds a copy of the cache line. The indication of which EV7 maintains a copy of the cache line in each individual line, anticipates a group of these individual lines which each maintain information indicating which EV7 holds a copy. As noted and discussed supra, a group of lines are transferred when a single line is transferred. Therefore if each single individual line maintains information about which EV7 holds a copy, the group as transferred maintains information about which EV7 maintains a copy.

### ***Conclusion***




Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Bradley whose telephone number is (571) 272-8575. The examiner can normally be reached on 6:30-3:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A. Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAS/mb



**DONALD SPARKS**  
SUPERVISORY PATENT EXAMINER